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EINSTEIN PROPOSES SYNCHRONIZED WORLD

Synchronization of the electrical pulse of the world, so that all astronomical, telegraphic and radio instruments shall be in exact tune with each other, was proposed in a communication presented by Albert Einstein, famous German physicist, at the recent meeting of the League of Nations Committee on Intellectual Cooperation.

The idea which Prof. Einstein endorses was first suggested by Prof. Arthur Korn, the German inventor of television apparatus. In the complexities of modern civilization, time-instruments accurate to microscopic fractions of seconds frequently determine the success or failure of important scientific work, govern industrial processes involving millions of dollars, and even guard the safety of human lives. Prof. Korn's proposal is that instead of the many separate clocks now used, a single master pendulum of extreme precision be employed, and its beats be signalled throughout the world by radio.

"Periodical signals with a period of from 1-200 to 1-500 seconds might be taken from a precision pendulum by means of a television apparatus," suggests Prof. Korn. "The length or duration of the signals might be graded so as to mark seconds and tenths of seconds. An agreement should be arrived at as to which wireless transmitting station should undertake this duty and as to the wave length. These signals should be received by relay stations in the various countries and broadcasted over smaller areas. Such stations need not be particularly powerful; five kilowatts would be sufficient. The synchronism might, if necessary, be transmitted further from these receiving stations by means of wires.

"Such a wireless transmission of world synchronism would, at first sight, appear to be costly," Prof. Korn states. "But the cost would probably be amply compensated for by the considerable saving which the elimination of the individual synchronizing apparatus of telegraphic installations depending on close synchronism would represent. Since it would probably not be easy to reach a practical agreement in these matters between the great wireless companies, the Governments should themselves intervene and reach an agreement at an international conference."

Commanding the proposal, Prof. Einstein outlined the procedure contemplated to put it into practical operation. He said: "The committee would invite the Governments of the countries in which the larger wireless firms are established to convene an international wireless congress. This congress would then have to enter into the necessary agreements for the execution of the undertaking described.

"The object of this proposal is to overcome the mutual jealousies of the firms

As a piece of copper of such a size has a very low resistance, large currents may be carried, and as theoxide film does not wear out the rectifier unit never needs to be replaced.

MOTHBALL-FLAVORED EGGS: POOR BIDDY! NOT HER FAULT

Pity poor Biddy the Hen! If she acts like a lady and eats what is set before her it may endow her high-priced eggs with weird flavors and make them unmarketable. And Bossy the Cow is no better off, for "doctored" grain spices her milk and even her meat with the tastes nobody likes.

MM. Boucley and Delasses, well-known French agricultural scientists, have reported to the French Academy of Agricultural Science that grain treated with an insect-killing compound to preserve it passed on its objectionable odor to the eggs of hens, the milk of cows, and the flesh ofpigs, sheep and rabbits that ate it. The compound, which is used all over the world in combatting moths and other insects, is known as paradichlorobenzene or more conveniently by its initials "PDB". It smells a good deal like ordinary mothballs, and the transmitted scent was strongly reminiscent of these unsavory marbles.

The two investigators also reported the observation of another worker, who had not fed the stuff to his hen but merely fumigated her with it for several hours to rid her of vermin. Even this external contact with the fumes of PDB was sufficient to ruin poor Biddy's eggs for a whole month.

WORLD'S RECORD CHROME ORE DEPOSIT FOUND IN MONTANA

A chrome ore deposit, said to be the largest known in the world, has been discovered near Columbus, Mont., on the edge of Yellowstone National Park. Prof. James F. Kemp of Columbia University, New York, after a close scrutiny in company with representatives of the U. S. Geological Survey, announced that the find is of importance to the metal industry of the world not alone because of the well-known rust resisting properties of chromium steel alloys, but also because chromium is rapidly supplanting nickel in the electroplating industry, its only disadvantage having heretofore been its higher cost.

Practically all of the chrome ore used in this country previously has been mined in Rhodesia, South Africa, selling in this country at about 40 dollars per ton. The Montana ore, after being refined at smelters and chemical plants now being erected, can be sold at about 20 dollars per ton.

Before the Civil War, cotton seed were not regarded as being of any value and were burnt by the ton.

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concerned and to prevent the scattering of forces and the complication of international communications which must necessarily result from the existence of several independent synchronising apparatuses."

MADAME CURIE FAVORS INTERNATIONAL SCHOLARSHIPS

When the educational theories of Madame Curie, France's famous woman scientist, go into actual practice, the world may have more first rate scientists and more fundamental feeling of good will between nations.

In a report to the subcommittee on university relations, which will later be acted upon by the Committee on Intellectual Cooperation of the League of Nations, she advances some new suggestions for the training of embryo scientists. Closer cooperation between master and pupil with more freedom for the student to prove his real worth are points that Madame Curie stresses chiefly.

Since science has become so specialized, students must go to the particular places where they can obtain the best training for the subject in which they are interested, regardless of whether it is at home or abroad, she maintains. In recommending a system of national and international scholarships to meet this need, she advocates two kinds: one for the student who is just beginning his research work, and the other for the advanced worker who may have already accomplished some research but who, without financial aid, would not be able to continue. The first is essentially, in her conception, an apprenticeship in which a student should work in groups of older, more experienced men until he has proved his value.

While she urges supervision and guidance of the student until he "finds himself", she would not hedge those who show real originality of mind too much about with the restrictions of academic red tape. "For", she says, "the exceptional mind is all too rare and should not suffer too much constraint."

Since this is an age of scientific development the need for more scientists is constantly growing. In consequence, declares Madame Curie, we need a more complete system of international scholarships and more endowed foundations both from governments and private donors to give adequate training to the world's scientific raw material regardless of the country in which it occurs.

There are about two billion books in the world, according to Dr. F. H. Vizetelly, well known language expert.

A new daylight screen for motion pictures uses a surface of colored strips continuously moved over two cylinders.

GAS FUEL PROPOSED FOR AMERICAN AIRSHIPS

By C. P. Burgess,
Aeronautical Engineer.
Bureau of Aeronautics, U. S. Navy

By far the most revolutionary change in lighter-than-air craft since the first practical airships were built about 1900 has been the introduction of helium for the inflation of American airships.

The importance of the development of helium should not be minimized, even though it has suffered the usual reaction against new inventions which have been over-praised by their too ardent friends. It is true that the fire danger in commercial airships filled with hydrogen is not nearly so great as it is frequently painted. The hydrogen cannot be ignited until mixed with air; and in commercial airships such a mixture cannot occur without previous damage to a gas cell. The real objection to hydrogen in commercial airships is that it may make a holocaust of what would otherwise be a minor accident.

It is for military andnaval purposes that helium is of paramount importance. In war, a hydrogen gas cell may be ripped open and the gas ignited by incendiary bullets. Against this danger, helium is an absolute protection. In a conflict between airships in which one is inflated with helium and other with hydrogen, the helium ship would have no less an advantage than the Confederate ironclad "Merrimac" had over her wooden antagonists, the frigates "Cumberland" and "Congress", which she sank or burned the day before theironclad "Monitor" appeared on the scene as champion to fight for the Union fleet.

Helium resembles armor as a protection against the effects of enemy gunfire; and it has also the disadvantage of armor in diminishing the load carrying power of the ship protected by it. Ever since the introduction of helium, the great problem has been to minimize the loss of endurance and carrying capacity involved in the change from hydrogen to helium. The eleven per cent. loss of lifting power per unit volume of gas is not the most serious loss with helium. An even greater loss comes from the fact that at the start of a flight, the gas space cannot be filled with helium, because, to obviate blowing off this costly gas through the valves, sufficient air space must be left to allow for gas expansion when the airship reaches the maximum altitude to be attained on the voyage. A hydrogen ship going on a long voyage is filled full of gas; and as the fuel load diminishes, a corresponding amount of gas is permitted to escape, and the ship can then rise to higher altitudes.

It is now proposed to increase the endurance or carrying capacity of helium airships by using ballonets containing coal gas surrounded by helium to ensure safety against fire, and occupying the volume which is normally waste air space at the start of a voyage. The coal gas will be burned with the liquid fuel in the engines, thus greatly increasing the total fuel supply, or permitting a reduction in the liquid fuel in favor of other useful load. At the same time, room is provided for the expansion of the helium as the ship rises.

It might be supposed that hydrogen would be better than coal gas to be used in this way, because of its less weight and greater life. Actually, coal gas is almost as efficient as hydrogen because it has a far greater fuel value per unit volume,

thus compensating for the smaller load of liquid fuel that it can support.

The greater advantage of coal gas over hydrogen as an airship fuel is in respect to safety. The proportion in which coal gas mixed with air is explosive extends over only one-sixth the range in which air and hydrogen mixtures are explosive.

It has recently been announced in despatches from Germany that the Zeppelin Company proposes to use gaseous fuel in a new airship which will be inflated with hydrogen. Even in a hydrogen filled ship, combustion of some of the gas with the liquid fuel provides an increase in the total effective fuel supply; but not nearly so much as in a helium ship, because there is no waste air space to be utilized. It is particularly noteworthy that, although this new German airship is inflated with hydrogen, the Zeppelin Company prefers to use another gas, presumably coal gas, for fuel.

BACTERIA LIKE HUMANS IN RESISTING DISEASE

Disease germs are like the human beings on which they prey, in that they themselves are subject to disease that may kill them, and resemble their victims further in that some of them are resistant to their microbial ills while others easily sicken and die, just as some human beings are passed by in an epidemic while others succumb. Their resemblance to human beings can be traced a step further, for "sick" bacteria show less energy and "pep" in their mischief-making, while "healthy" ones carry on with vigor.

This is the gist of the report of a series of experiments by Dr. L. O. Dutton, at the Methodist Hospital in Memphis, which appeared in a recent issue of the Journal of Infectious Diseases. Dr. Dutton worked with the deadly streptococcus or chain-germ that causes blood-poisoning and other serious diseases and infections, subjecting it to the attack of bacteriophage, the mysterious invisible principle or virus that causes bacteria to sicken and die. He found that various cultures of the germ, taken from patients in the hospital, showed widely different powers of resistance to the bacteriophage, some of them dying and dissolving in a very short time, while others, apparently made up of tougher citizens of the germ world, carried on without showing much effect.

Dr. Dutton tells of one critical case involving a human patient. This patient, a woman, was seriously sick with an infection of a strain of streptococcus which had not shown much power of resistance to bacteriophage when cultivated in a glass flask. When an injection of a bacteriophage solution was made into the patient's blood stream she at once showed signs of improvement and in time completely recovered. The assumption is that before the treatment the germs were "feeling fine" and were therefore very active; afterwards the germs themselves got sick and finally died, permitting the patient to get well.

GERMANS WIPE OUT MYSTERIOUS DISEASE

Discovery of the cause of the mysterious "Haff sickness" which was proving ruinous to a large part of the German Baltic fisheries industry, together with the elimination of the disease virtually by government fiat, has been announced. It is one of the very few cases on record where an edict had power to end an epidemic, or at least what looked like one.

A little over two years ago, fishermen in the stretch of shallow water along the southern end of the Baltic between Koenigsberg and Danzig, known locally as "the Haff", began to develop a very painful and in some cases fatal disease. Its symptoms were extreme pain and a kind of paralysis of some of the leg muscles, together with certain physiological disturbances. It always attacked its victims while they were out in their boats, and generally in the early morning, while themists still hung over the water. A few days on shore usually resulted in complete recovery, but a return to fishing might bring on repetitions of themalady. In a short time the Haff fisheries were badly demoralized.

The theory that it might be an epidemic of a germ disease quickly went by the board. The "Haff sickness" had none of the earmarks of an ordinary epidemic. Likewise the theory that it might be caused by the eating of spoiled fish or eels had to be abandoned, because many of the victims did not eat fish, and fish-eaters on shore never suffered from the disease.

The investigators finally came to the conclusion that there must be something in the water that rose into the morning mists and caused the disease by poisoning the air. Research along this line soon showed that they were right. The disease was really a kind of arsenic poisoning, caused by the discharge into the water of great quantities of factory wastes from cities on shore. These wastes contained arsenic compounds, which were altered into gaseous form by small organisms living in the water, and thus released into the air to plague the luckless fishermen. The arsenic was present in the factory materials only as an impurity, so that it was no hardship to the industries when the government ordered them to change to the use of other materials with a lower percentage of arsenic. Within a few months the "Haff sickness" had virtually vanished.

RADIO HITS SHELLAC INDUSTRY

With the radio replacing the phonograph in almost every home the shellac shipments from India into this country are only half what they used to be two years ago. At least half of the shellac used in the United States, which is one of the biggest importers of this necessary constituent of varnish, formerly went into the manufacture of phonograph records, according to a report to the American Chemical Society.

In consequence the shellac producers of India, or rather the human powers who have control of the sticky gum deposited on the twigs of trees by the lac insects, have become panicky. They likewise remember the decline and fall of the indigo industry when synthetic indigo was finally produced in the laboratory. Anxious to forestall a similar fate for natural shellac they have attempted to safeguard

themselves by getting in on the ground floor of the synthetic stuff in establishing a Lac Research Institute which has as an additional aim the improvement of the quality and output of their produce.

"TOXAMINS", OPPOSITE OF VITAMINS, DISCOVERED IN OATMEAL AND BREAD

Vitamins, the group of beneficial though little-known substances found in certain foods, have a family of evil-doing opposites, according to Prof. Edward Mellanby, F.R.S., of Sheffield University. These malignant twins of the vitamins he has christened "toxamins", and he claims that they exist in greatest concentration in the foods that are used as the principal elements of diet by large sections of the white race. The most notable offenders in harboring his newly-discovered causes of ill-health, he says, are oatmeal and wheat. The principal effects of thepresence of toxamin so far investigated are prevention of proper bone formation, and in some cases serious nervous disorders.

The harmful effects of oatmeal and other cereals on the development of bone can be reduced if the cereals are allowed to germinate for some days and are then heated at boiling temperature for eighteen hours. Both germination and heat are necessary for this purpose, it is stated.

The scientific reason for spreading butter on our bread is that apparently the harmful effect of the toxamins in cereals is counteracted by the fat-soluble vitamins, which are present in the butter.

The troubles which vitamins act to prevent and cure have long been regarded as being due merely to a lack of the proper vitamins in the diet, so that these diseases, such as rickets and beri-beri, have come to be known to physiologists as "deficiency diseases". If Prof. Mellanby's claims are confirmed by later investigation, an entirely new aspect will be placed on this whole series of ailments, since their causes will be transferred from a merely negative category to a group of really positive evils. Many physiologists and physicians are still doubtful of the genuineness of the new discoveries, and the subject is one that is likely to be much controverted for a time.

DUST IN AIR GIVES SCANDINAVIA SILVER NIGHTS

"Silver nights" or unusually bright twilight from sunset to sunrise, has been forecasted for Sweden this summer by astronomical experts.

Formerly such phenomena caused widespread consternation, as the light was bright enough to read by in Stockholm at midnight. Many people thought it foreshadowed the day of Last Judgment. Now scientists have discovered that it is due to volcanic ash spreading through the upper layers of atmosphere and reflecting the sun's rays back to the earth. The recent eruptions of a volcano on the Kamtchatka peninsula, of another in Japan, and also that of Mauna Loa in the Pacific, foreshadow a recurrence of the extra brilliant twilight this summer. The Swedish landscape is

ordinarily remarkable during the long sunlit summer nights, but the silver light gives it a weird beauty.

The earliest systematic observations of the gradual spread of fine volcanic ash date from May, 1883, when the entire island of Krakatoa in the East Indies was blown up by the bursting of a volcano. The explosion was heard as far as the Philippines, Hong Kong, western Australia and India, and the amount of ashes thrown up has been estimated at 18,000,000 cubic meters. By November of that year the finer layers reached Europe, causing extra red sunsets, and in Sweden the twilight was made brighter for the next three summers. The passage from the Straits to Sweden required less than three months. In 1902, after the eruption of Mount Pelee on the West Indian island of Martinique, the dust was first observed in about six weeks. "Silver nights" were observed in Sweden again in 1908, but exactly where the dust then came from it was not possible to determine, since volcanoes often erupt in isolated regions where the event is not reported.

GERMAN ASTRONOMER DISCOVERS COMET

Kopff's comet, discovered by a German astronomer in 1908, has returned to the earth's environs again, as it does every six and a half years, and another German astronomer, Prof. Max Wolf, at Heidelberg, has been the first to pick it up, according to an announcement made by the Harvard College Observatory. The Harvard Observatory has just received word of the discovery, which was made July 13, from the international clearing house for astronomical discoveries at Copenhagen.

When discovered, the comet was of the 16th magnitude, far too faint to be seen except with a large telescope, and was situated in the constellation of Pisces. Its exact position, as astronomers express it, was then 1 hour, 17 minutes and 12 seconds right ascension; and 18 degrees 14 minutes north declination. These are the celestial equivalents of longitude and latitude. The comet was moving northeast, towards the neighboring constellation of Aries.

ARCHAEOLOGICAL STUDENTS TO VISIT ANCIENT AMERICAN RUINS

A thousand mile motor tour covering all of the important sites of pre-historic habitation in the Southwest has been arranged by the School of American Research at Santa Fe, as part of its summer work. The tour will begin the middle of August after the annual Santa Fe fiesta.

Unlike the numerous commercial tours which are conducted all over the globe, the archaeological tours are restricted. Only students of anthropology, ethnology, history and art, who can convince the directors of their serious interest in the early culture of man in the Southwest will be accepted. A member of the staff of the school will accompany each party to lecture at all important points.

The student tour is the first of its type in this country although similar

tours have been conducted for years by other branches of the Archaeological Institute of America in Greece, Italy and the Holy Land. Theobject of the American tour is to familiarize students with the country occupied by the aborigines and the remains of their culture as discovered at the various excavations in progress. The tour will cover the Puye cliff dwellings, Taos, Mesa Verde, Aztec, Chaco Canyon, Navajo Desert, Zuni, Inscription Rock, Acoma and the Enchanted Mesa and the Gran Quivira.

In addition to the extended tour the school will conduct archaeological tours of a single day to the excavations at the ruins of Pecos, Puye and Gran Quivira in connection with its August lecture course on "Man and Nature in the Southwest." The lecturers for the summer course are: HartleyBurr Alexander, University of Nebraska; Dr. A. E. Douglas, University of Arizona; Dr. Sylvanus G. Morley, Carnegie Institution; Dr. Alfred V. Kidder, Phillips Academy; Dr. Edgar L. Hewett, Kenneth M. Chapman and Lansing B. Bloom of the School of American Research.

IRON SALT RECOMMENDED AS CURE FOR POISON IVY

Poison ivy meets its match in the iron compound known as ferric chloride, according to a new booklet on the toxic weed by Dr. James B. McNair, which is being issued by the Field Museum of Natural History. Dr. McNair discovered in the course of exhaustive researches on the chemical nature of ivy poison that this substance is rendered insoluble and thus made harmless by chemical union with iron. A number of soluble iron salts, he says, are effective against poison ivy, but he has found ferric chloride to be most suitable. His treatment calls for a mixture of one part by weight of ferric chloride with ten of alcohol and ten of water, to be washed on the skin and allowed to dry there, before one goes into places where poison ivy grows, and also after such possible exposure. This, it is claimed, will entirely prevent the development of ivy poisoning in the great majority of cases.

OXIDIZED COPPER SURFACE TO AID BATTERY CHARGING

A simple oxidized surface of copper may replace vacuum tubes, acid solutions, or mechanical vibrators in new current rectifiers, which change alternating into direct current for charging storage batteries and operating radio sets, if a new discovery of L. O. Grondahl, New York engineer, comes into wide use.

By subjecting a piece of metallic copper to a high temperature, a coating of oxide of copper forms on its surface, and Mr. Grondahl has found that such an oxide layer has the property of allowing an electric current to pass through it in one direction only. If an alternating current, which flows first in one direction and then in another, changing faster than a hundred times a second, is passed through a such a device, it is changed into a current which pulsates, but only flows in one direction.

In practice Mr. Grondahl uses a copper disc one and a half inches in diameter, against which is firmly pressed a piece of lead, in contact with the oxide coating.

TABLOID BOOK REVIEW

POTASH, A Review, Estimate and Forecast. By J. W. Turrentine, In Charge, Potash Investigations, Bureau of Soils, U.S. Department of Agriculture, New York: John Wiley & Sons. $3.00.

This is the first and complete competent review we have had of the potash situation which became a question of vital importance during the war. Dr. Turrentine discusses first the European sources of potash, showing that the development of American sources of potassium salts, stimulated by the war, was checked by the low prices resulting from the importation of the fertilizer at low prices, not on account of the competition between the German and French producers, but because they had combined to crush out American industry, and he believes that the French-German monopoly will now gradually raise prices. Therefore, it becomes necessary to develop all available American sources of potash, among which he enumerates sea kelp, surface andsubterranean brines and deposits, silicates and industrial wastes such as sugar, cement, blast-furnace, borax and alcohol.

BIOLOGICAL RELATIONS OF OPTICALLY ISOMERIC SUBSTANCES, by Arthur R. Cushney, M.A., M.D., LL.D., F.R.S. Baltimore: The Williams & Wilkins Company. 1926. $2.00.

This is a skilful survey of a difficult field of research, a very weedy field of bio-chemical literature. Strange that two carbon compounds, absolutely identical in chemical composition and connections and differing only in that one is the mirror-image of the other, should show important differences in physiological effects. Professor Cushny found that the left-handed form of hyoscyamine is twenty times as powerful as its right-handed twin.

ACROSS BORDERLINES. Vol. II of Books of Goodwill. Compiled by Florence Brewer Boeckel. Washington: National Council for Prevention of War. 75 cents.

A volume of readings and exercises for schools in thepromotion of peace. Contains several scientific articles showing the unity of knowledge and cooperation in nature.

COSMIC EVOLUTION; by John Elof Boodin. New York, The Macmillan Company, 1926. 484 pp., $3.50.

Prof. Boodin, who is professor of philosophy at Carleton College, believes that scientific materialism and religious idealism are fundamentally incompatible. With this in view he gives a new interpretation to scientific results, considering such things as neural functioning and the theory of relativity.
